US006913541B2

(12) **United States Patent**
Chen

(10) **Patent No.: US 6,913,541 B2**
(45) **Date of Patent: Jul. 5, 2005**

(54) **GOLF PUTTING TRAINING APPARATUS**

(76) Inventor: **David Chen**, 9F-1, No. 629, Sec. 1, Chung Teh Road, Taichung (TW)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 222 days.

(21) Appl. No.: **10/108,552**

(22) Filed: **Mar. 29, 2002**

(65) **Prior Publication Data**

US 2003/0186753 A1 Oct. 2, 2003

(51) **Int. Cl.**[7] **A63B 69/36**
(52) **U.S. Cl.** **473/161**
(58) **Field of Search** 473/151, 157, 473/158, 160, 161–163, 197, 279

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,247,112	A	*	1/1981	Del Raso	473/153
5,087,045	A	*	2/1992	Kim	473/152
5,100,145	A	*	3/1992	Kim	473/160
5,301,947	A	*	4/1994	Kim	473/153
5,718,639	A	*	2/1998	Bouton	473/151
5,733,200	A	*	3/1998	Kim	473/161
5,855,522	A	*	1/1999	Bevan	473/160
2002/0128084	A1	*	9/2002	Lee et al.	473/132

* cited by examiner

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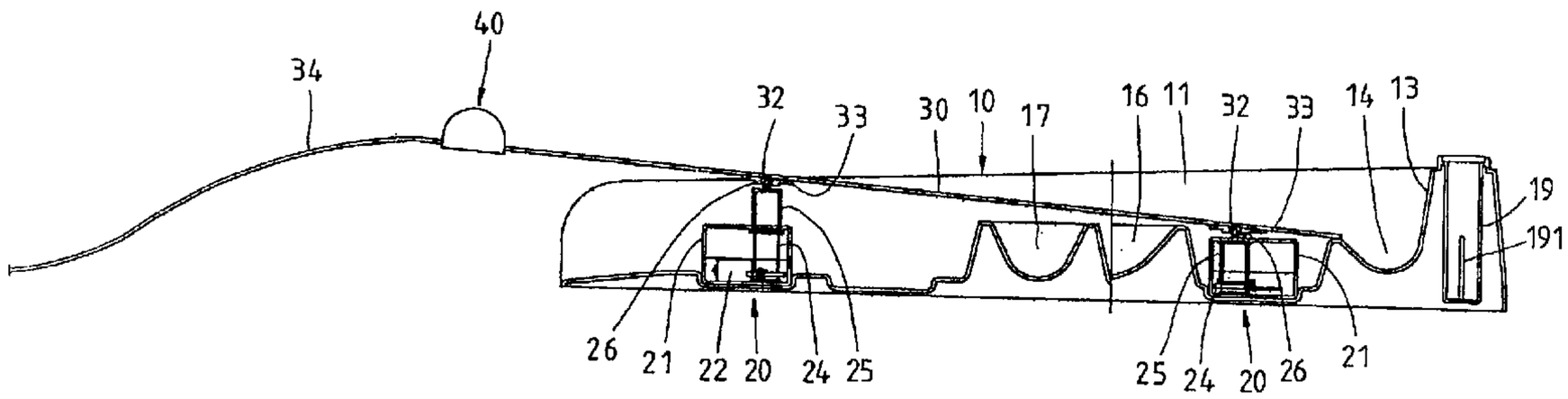
(57) **ABSTRACT**

A golf putting training apparatus comprises a base, which has a ball hole, a detect device disposed in the ball hole, a back tunnel, a return tunnel and a connect tunnel communicating the ball hole with the return tunnel. Three motor-driven elevating assemblies are disposed at the base. Each elevating assembly has an elevating device to be driven to move upwards and move downwards. The elevating assemblies are not arranged in a line for the top ends of the elevating devices can construct a face. A movable surface has a ball aperture thereon. The top ends of the elevating devices of the elevating assemblies connect movable surface for drive the movable surface to be bent to change the slope thereof. A interface unit has a display portion thereon for displaying corresponding information and a setting portion thereon for manual operating, and a control unit is for controlling the elevating devices of the elevating assemblies to move.

19 Claims, 10 Drawing Sheets



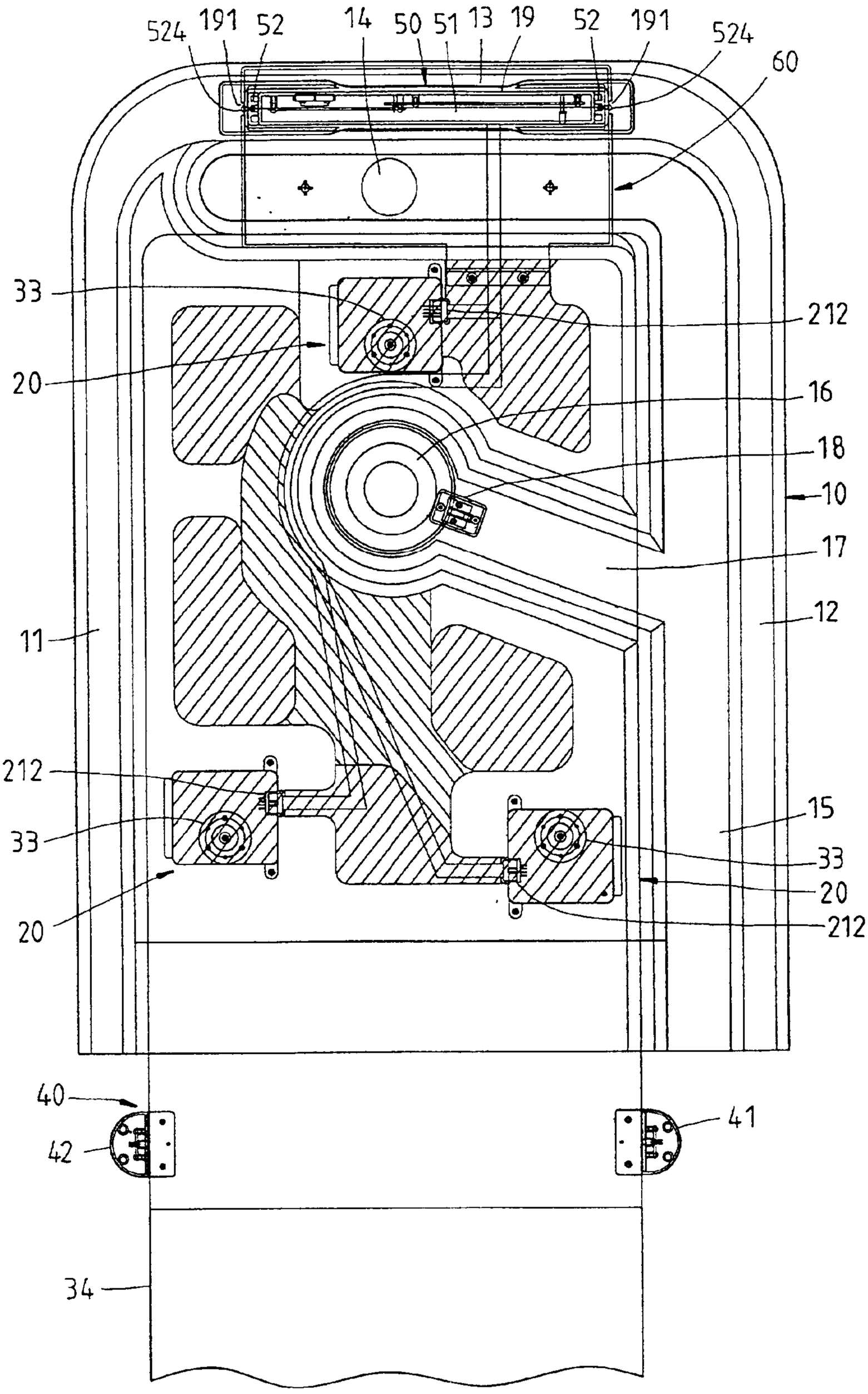

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FIG. 1

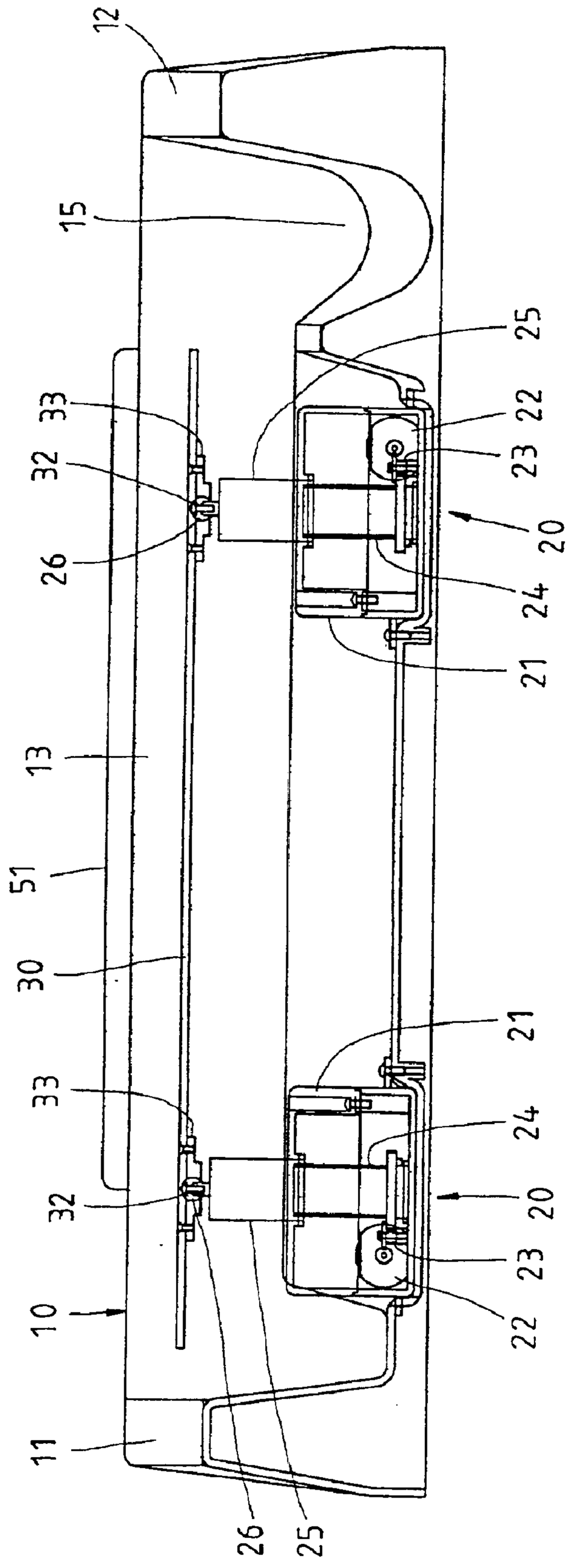
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FIG. 2

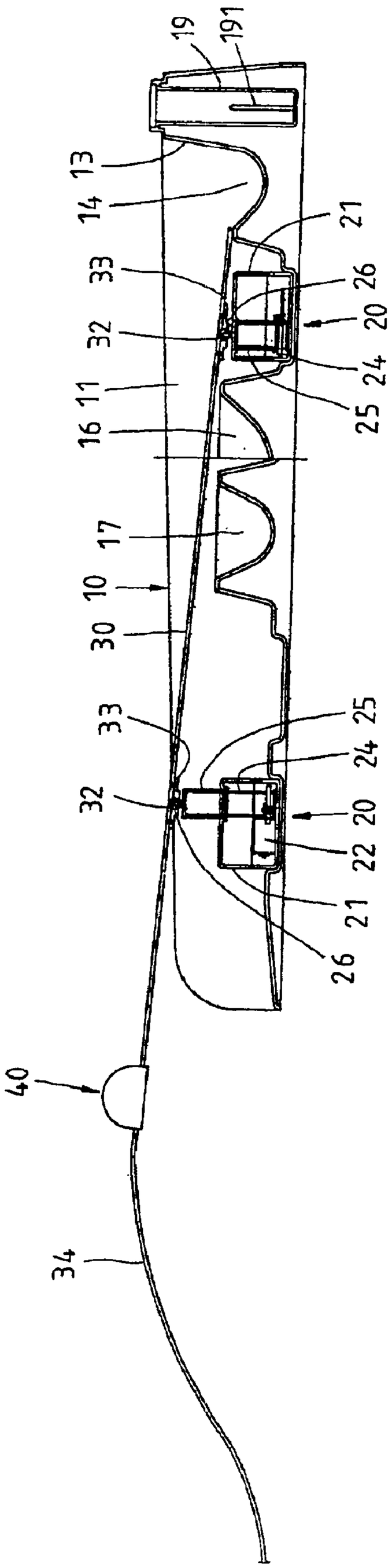
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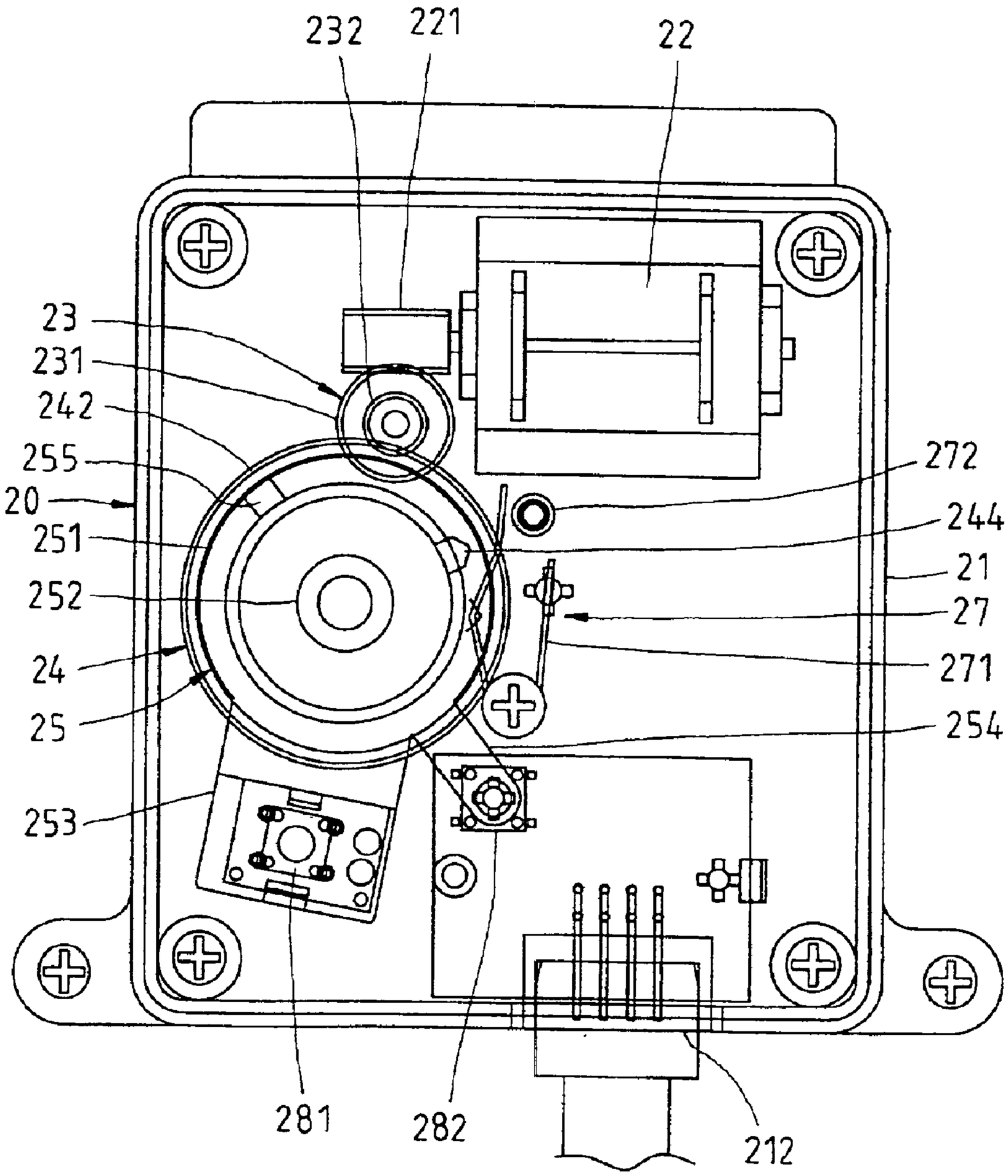
FIG. 3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221
22
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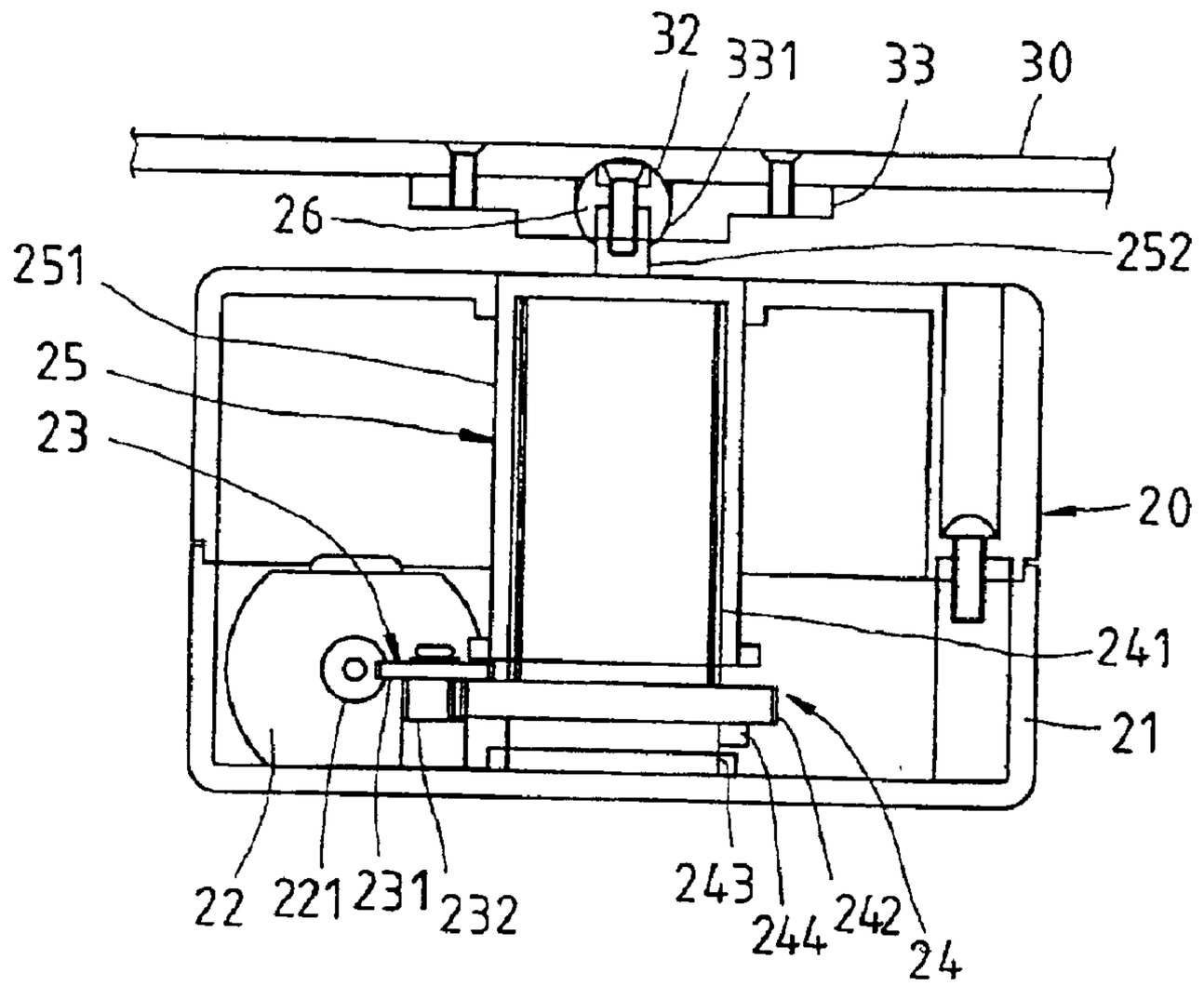
282
212

FIG. 4


32
331
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241
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FIG. 5

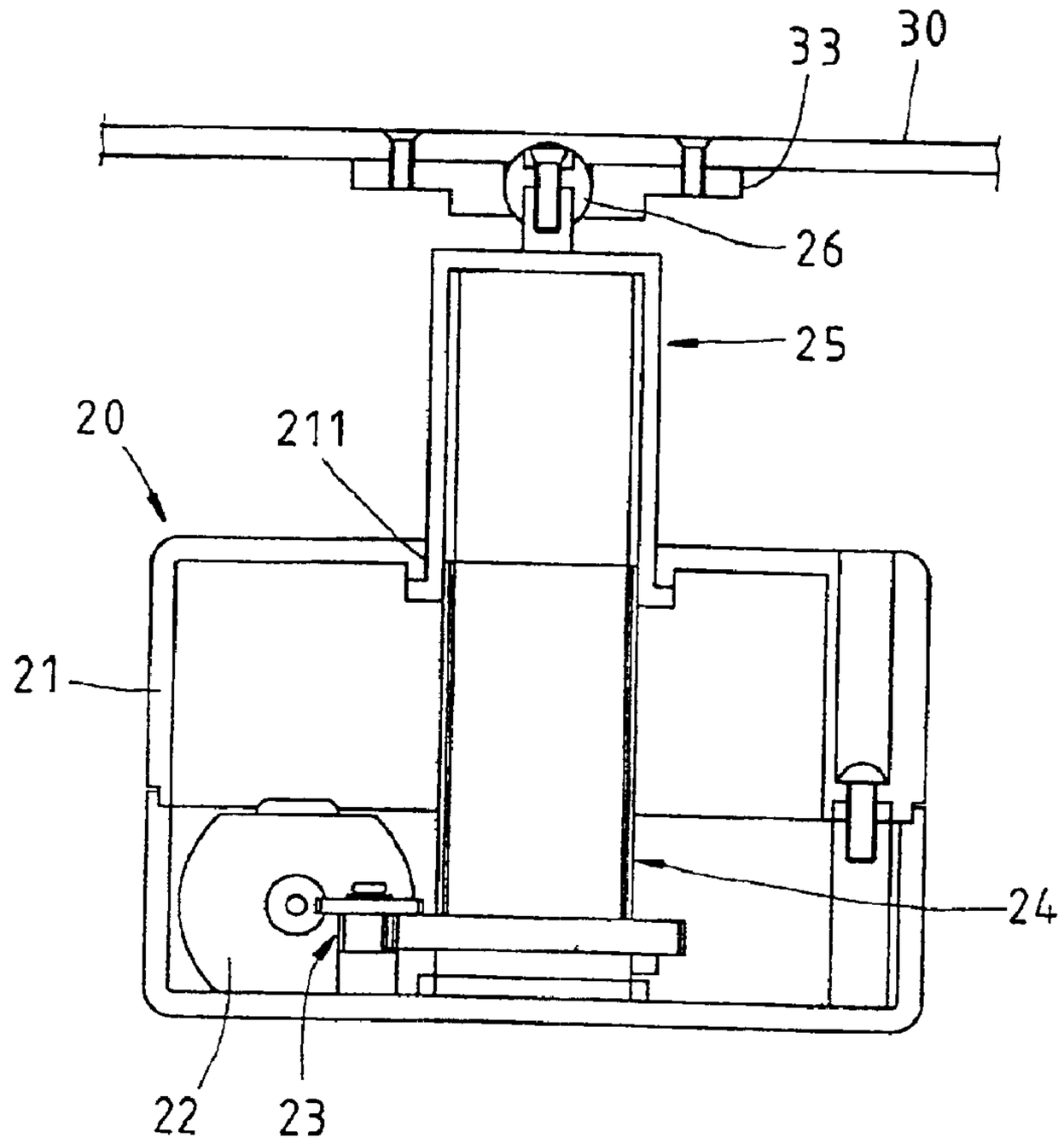
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FIG. 6

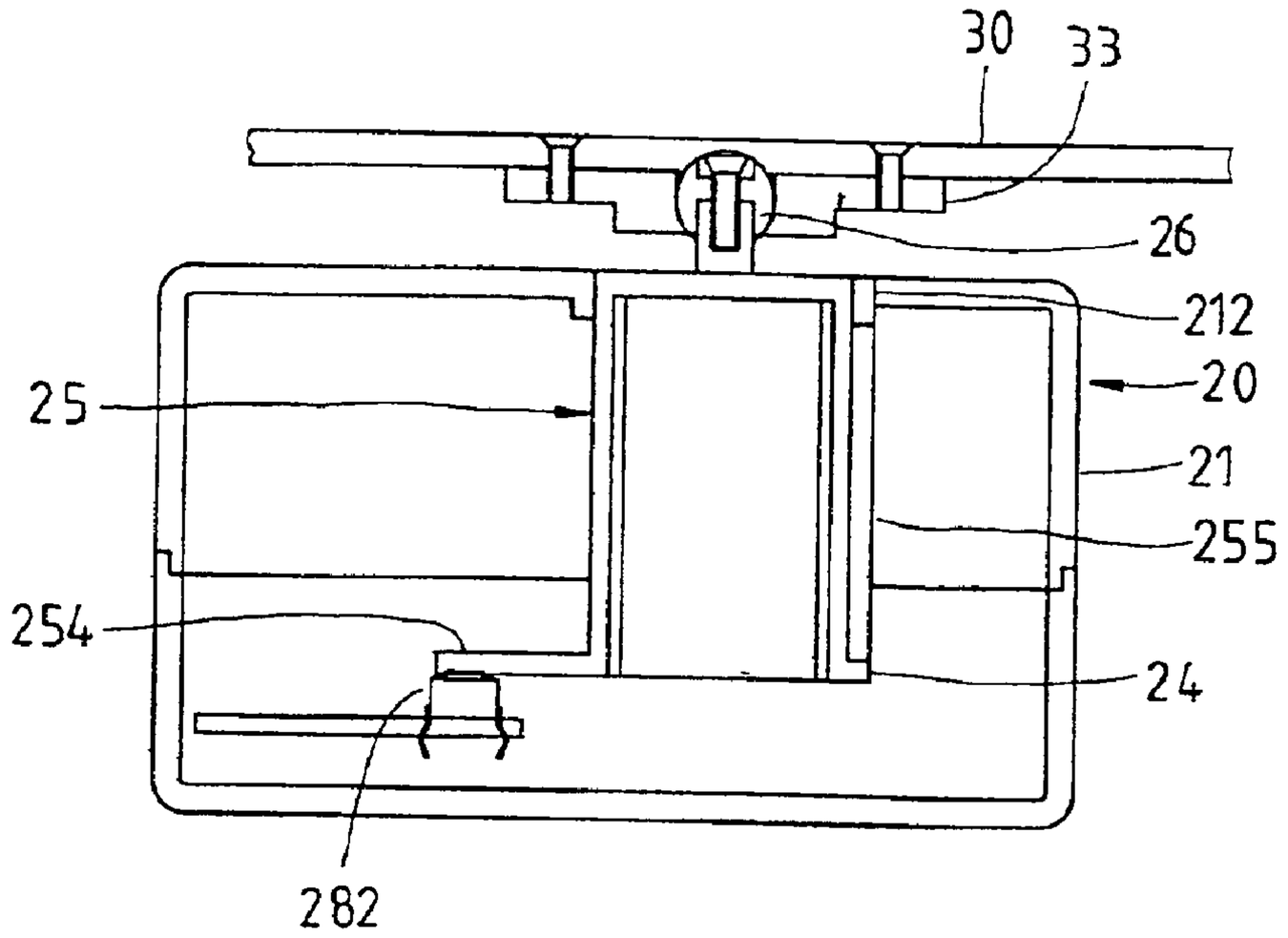


FIG. 7

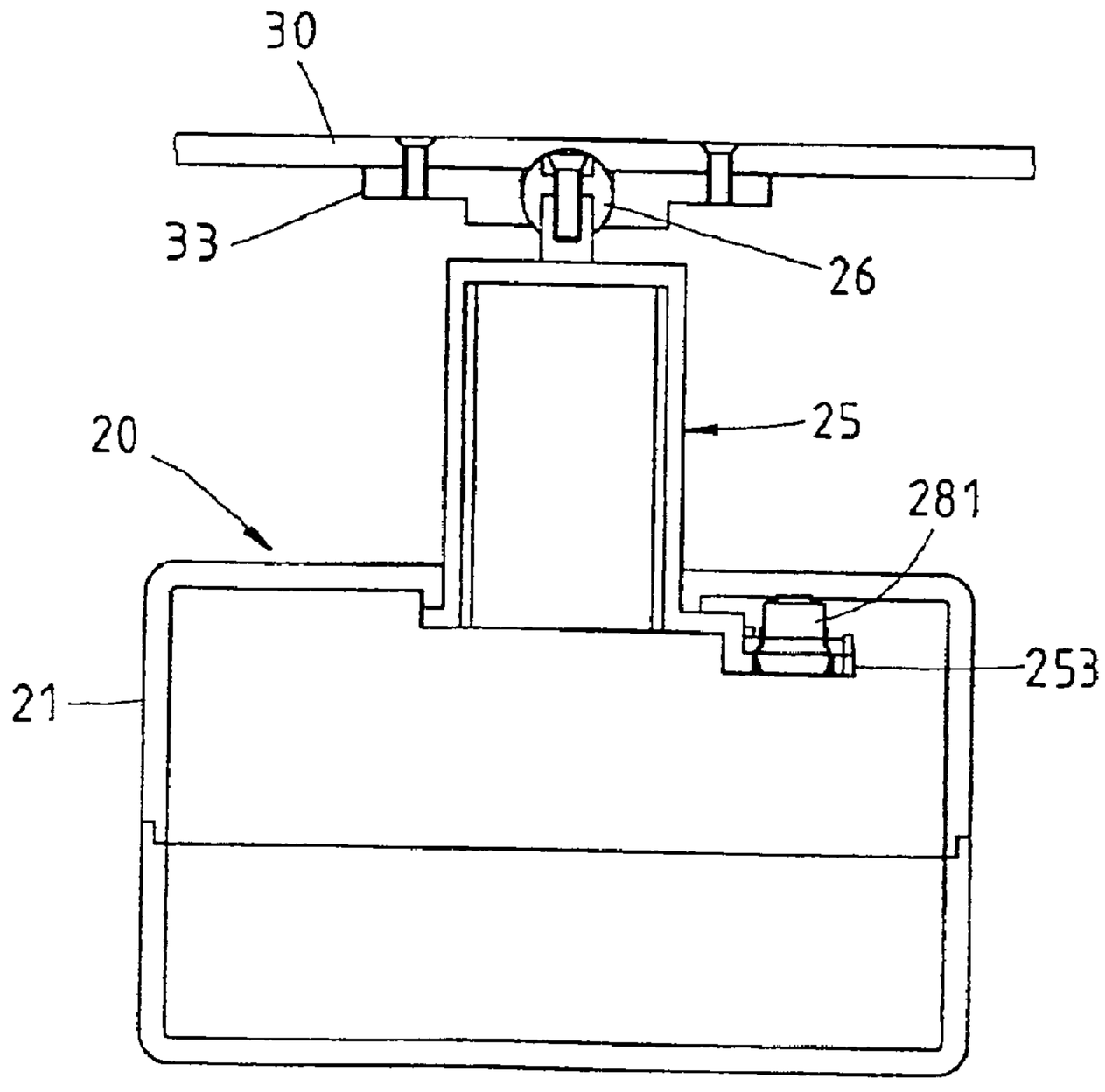
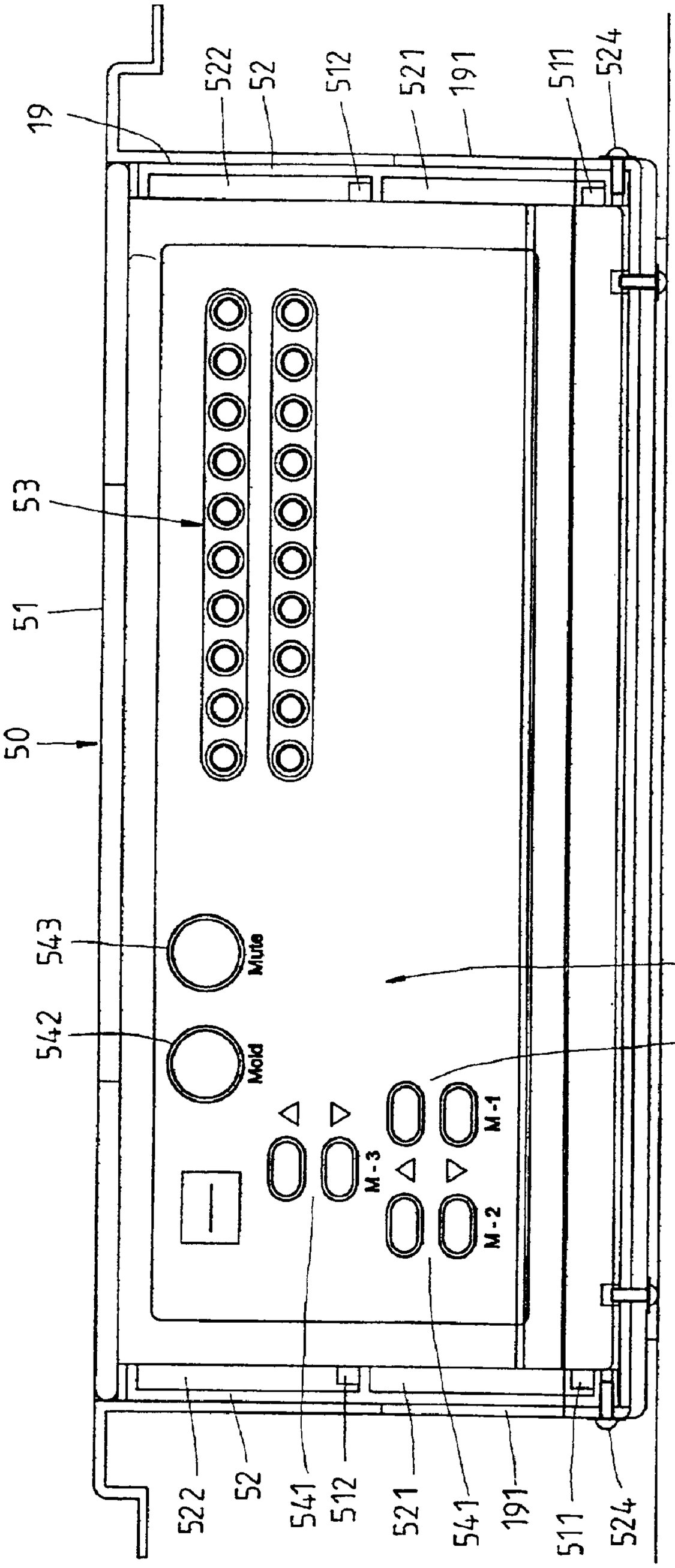


FIG. 8


19
522
52
512
521
191
511
524
53
51
50
543
542
Mute
Mold
M-3
M-2
M-1
54
541
522
52
541
512
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541
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511
524

FIG.9

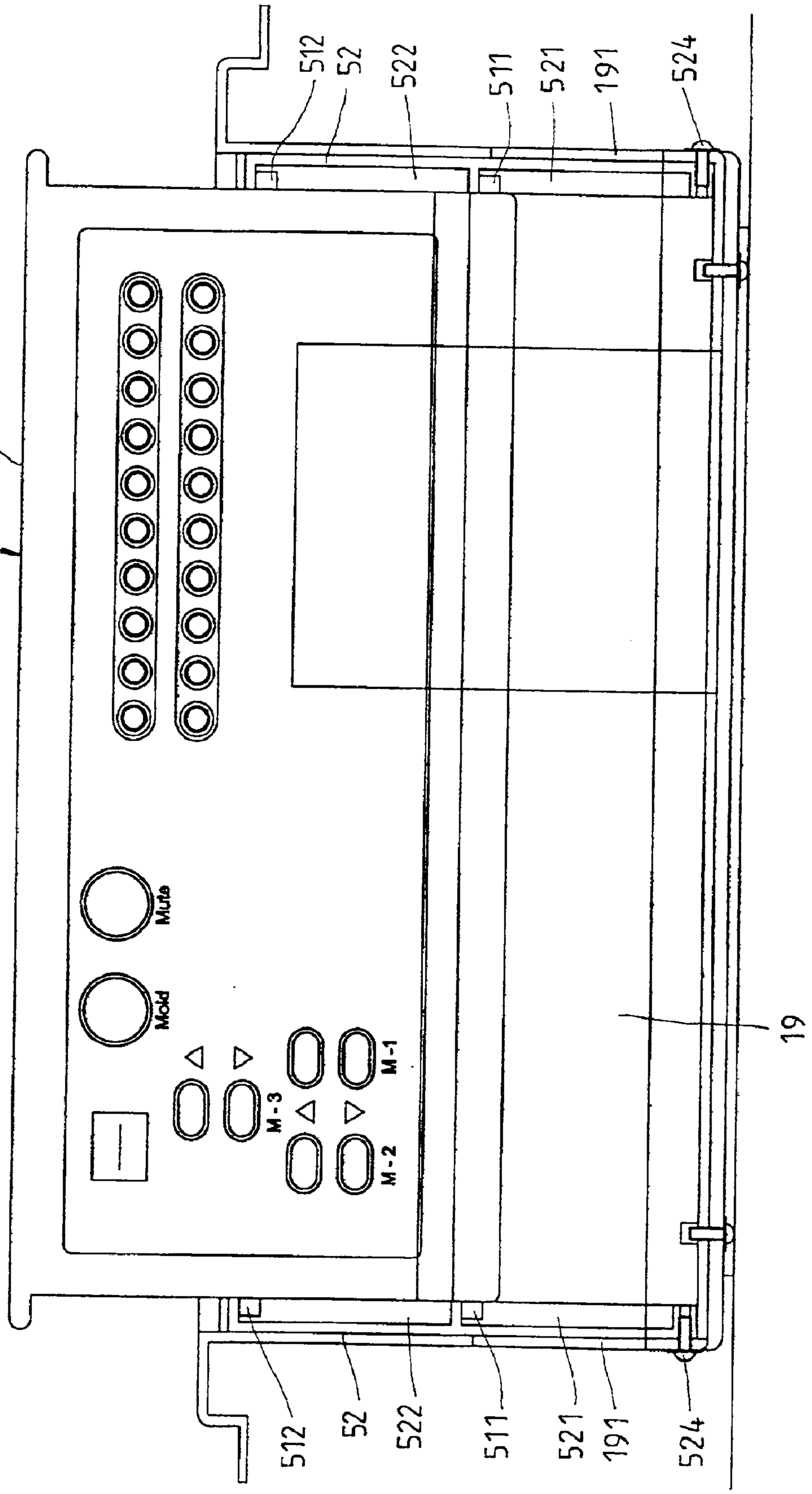
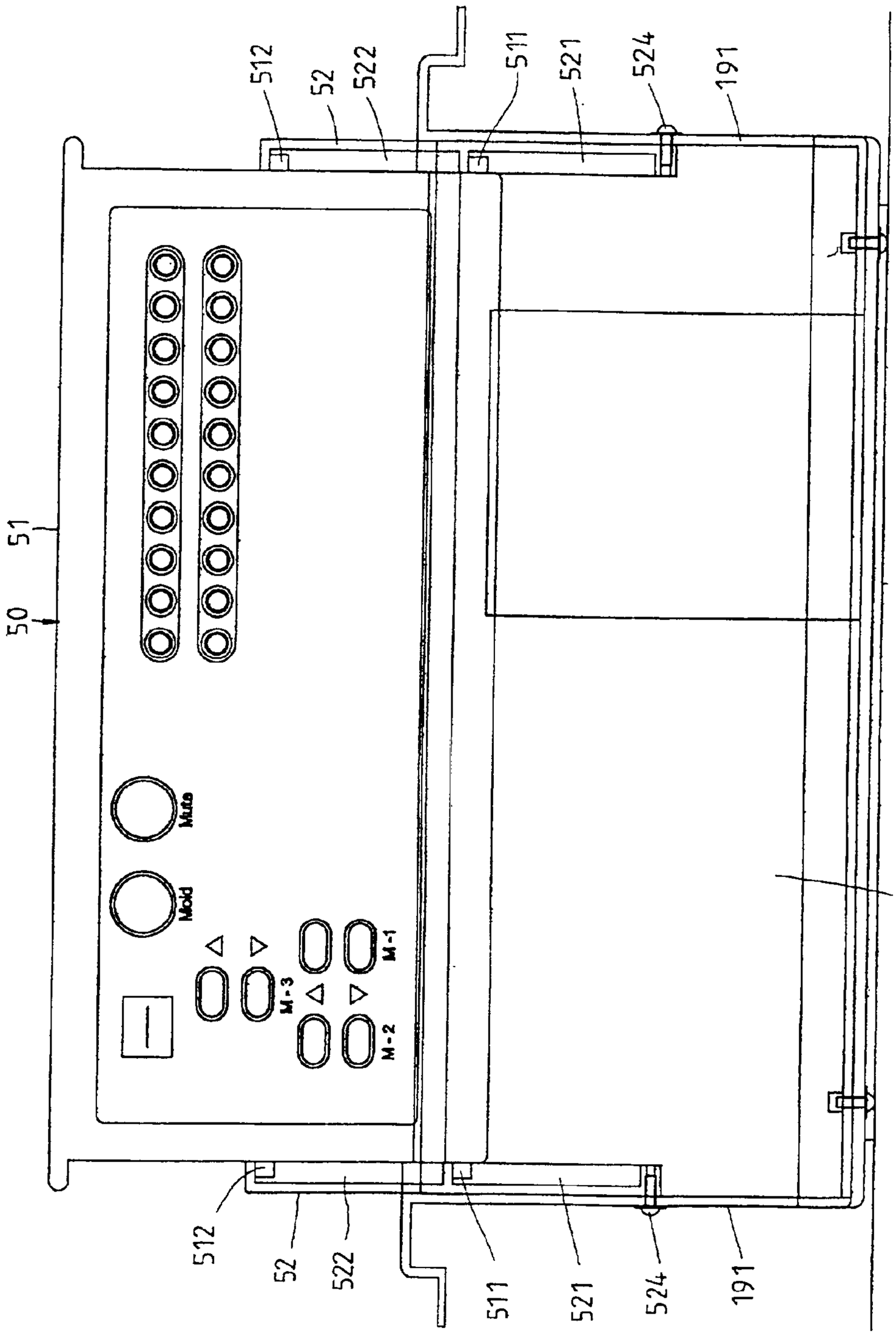


FIG.10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M-1
M-2
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FIG. 11

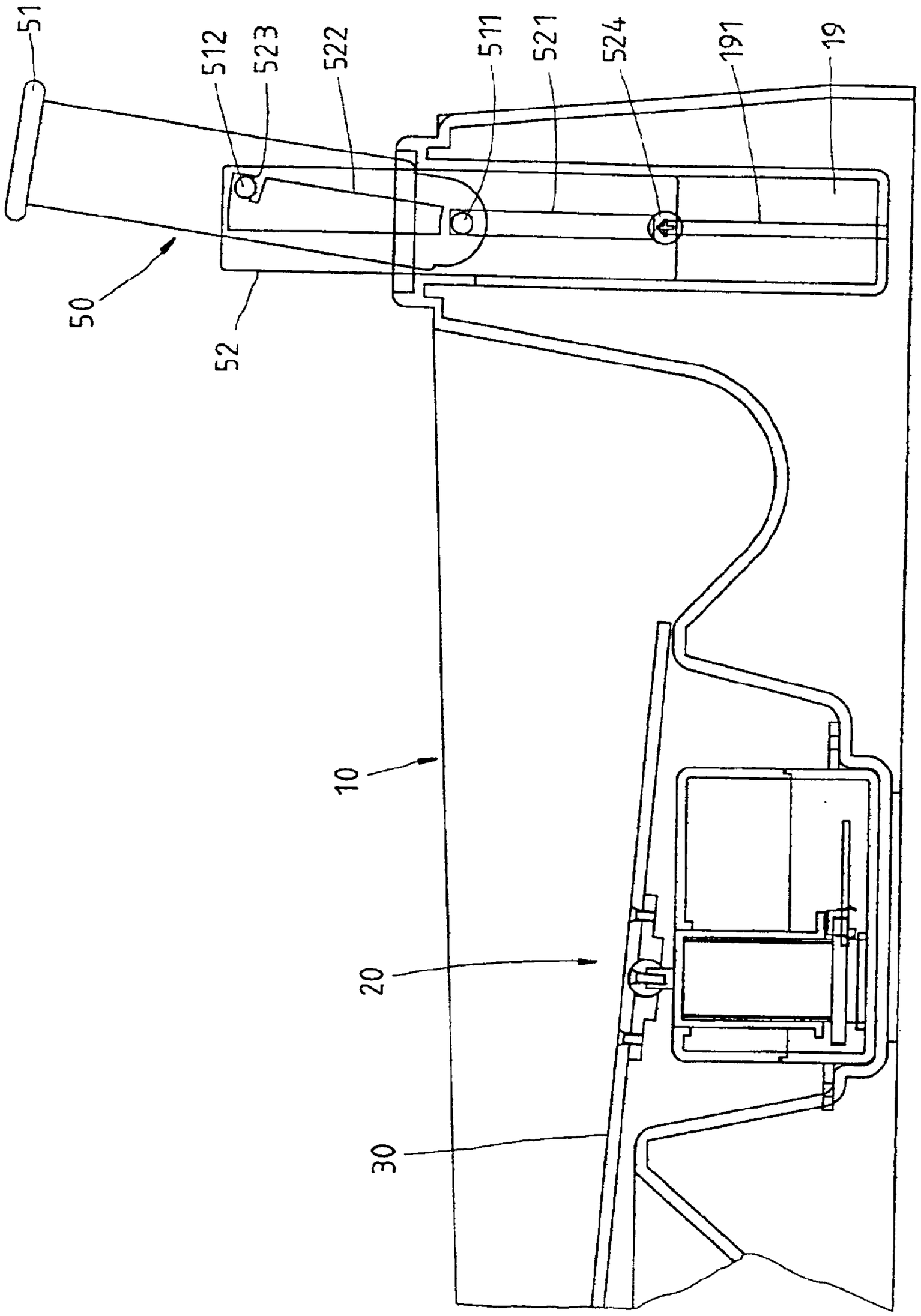

FIG. 12

GOLF PUTTING TRAINING APPARATUS

FIELD OF THE INVENTION

The present invention relates to a golf relative tool, and more particularly to a golf putting training apparatus.

BACKGROUND OF THE INVENTION

In the prior art, a conventional golf putting training apparatus provided a base, a inclined path in front of the base and a goal on the base. The slopes of the base and the path are fixed in the prior art. User will get bore after a long time of putting. The putting skill will not improve after user get use to the training apparatus.

Although there were some golf putting training apparatus providing the function of changing the slope, but the mechanism of changing slope needs manual operating or needs to switch the whole set of the path. The procedure of changing slope is very complex. It is hard to change the slope of the training apparatus whatever user wants in training.

SUMMARY OF THE INVENTION

The primary objective of the present invention is to provide a golf putting training apparatus, which can change the slope by motor-driven to provide a convenient way to change the slope.

The second objective of the present invention is to provide a golf putting training apparatus, which provide a programmable way to change the slope.

According to the objective of the present invention, a golf putting training apparatus comprises a base. At least three elevating assemblies disposed at the base. Each elevating assembly has an elevating device to be driven to move upwards and move downwards. The elevating assemblies are not arranged in a line for the top ends of the elevating devices can construct a face. A movable surface has a ball aperture thereon. The top ends of the elevating devices of the elevating assemblies connect movable surface for drive the movable surface to be bent to change the slope thereof, and a control unit for controlling the elevating devices of the elevating assemblies to move.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a top view of a prefer embodiment of the present invention;

FIG. **2** is a front view in part of the prefer embodiment of the present invention;

FIG. **3** is a lateral view of the prefer embodiment of the present invention;

FIG. **4** is a top view of an elevating assembly of the prefer embodiment of the present invention;

FIG. **5** is a lateral view of the elevating assembly, showing the elevating assembly moving to the bottom dead point;

FIG. **6** is a lateral view of the elevating assembly, showing the elevating assembly moving to the top dead point;

FIG. **7** is another lateral view of the elevating assembly in FIG. **5**;

FIG. **8** is another lateral view of the elevating assembly in FIG. **6**;

FIG. **9** to FIG. **11** are front views of the prefer embodiment of the present invention, respectively showing a case being totally received in, half exploded and totally exploded from the case slot, and

FIG. **12** is a lateral view of an interface unit of the prefer embodiment of the present invention, showing the case being totally exploded and lay back.

DETAIL DESCRIPTION OF THE INVENTION

Please refer to FIGS. from FIG. **1** to FIG. **3**, a golf putting training apparatus of the prefer embodiment of the present invention comprises a base **10**, three elevating assemblies **20**, a movable surface **30**, an optical sensor **40**, a interface unit **50** and a control unit **60**.

The base **10** is a rectangular element for putting on ground. The base **10** has three sidewalls **11**, **12** and **13** at back side and two lateral sides respectively. The base **10** further has a back tunnel **14** beside sidewall **13** at the back side and a return tunnel **15** beside the sidewall **12** at right side. The back tunnel **14** communicates with the return tunnel **15** at right end thereof. The back tunnel **14** is inclined downwards from left side to right side. The return tunnel **15** is inclined downwards from the end communicating with the back tunnel **14** to the opposite end. The return tunnel **15** is opening at the front side of the base **10**. The base **10** has a ball hole **16** in front of the back tunnel **14**. A connect tunnel **17** communicates the ball hole **16** to the return tunnel **15**, which is inclined downwards from the end communicating with the ball hole **16** to the end of communicating with the return tunnel **15**. A detect device **18** is disposed at the bottom side of the ball hole **16** to detect whether a ball ran into the ball hole **16**. The detect device **18** is a micro-switch in this prefer embodiment, but it also can replaced by optical sensor and the like. The base **10** has a case slot **19** at the top end of the sidewall **13** at back side, in which has two lock slots **191** at the lateral walls respectively as shown in FIG. **11** and FIG. **12**.

The elevating assemblies **20** are disposed on the base **10**, one of which positions at back side of the ball hole **16** and the other two of which position at front side of the base **10**. Each of the elevating assemblies **20** comprises the following elements.

A case body **21** is secured on the base **10**, which has a round hole **211** at topside thereof and a recess **213** in the hole **211**. The case body **21** has an electric socket **212** at a lateral side thereof.

A motor **22** is secured in the case body **21**, which has a worm shaft **221** fastening to the output shaft of the motor **22**.

A transmit device **23** has a worm portion **231** and a gear portion **232** along same axis. The transmit device **23** is pivoted in the case body **21** with the worm portion **231** thereof meshed with the worm shaft **221** of the motor **22**.

A rotatable device **24** has a screw portion **241**, a gear potion **242** and a shaft portion **243**. The shaft portion has a flange **244** at out surface thereof. The rotatable device **24** is disposed in the case body **21** with an end of the shaft portion **243** pivoted at a side of the case body **21** and the gear portion **242** meshed with the gear portion **232** of the transmit device **24**.

An elevating device **25** has a screw tube **251**. The screw tube **251** has an opening end and a closed end. The screw tube **251** has a second tube **252** disposed at the closed end thereof, a switch seat **253** disposed at out surface thereof closing to the opening end and an arm **254** disposed at the opposite side from the switch seat **253**. The screw tube **251** of the elevating device **25** is inserted into the hole **211** of the case body **21** and meshed with the screw potion **241** of the rotatable device **24**. The screw tube **251** has a rib **255** at out surface thereof to engage to the recess **213** in the hole **211** of the case body **21** for the screw tube **251** only can slide along the axial direction thereof but can not rotate.

A ball head **26** is secured the distal end of the second tube **252** of the elevating device **25**.

A counter **27** has a metal elastic member **271** and a metal terminal **272**. The elastic member is a torsional spring in this prefer embodiment disposed at the case body **21** beside the rotatable device **24**. The elastic member **271** has an end thereof fastening to the case body **21** and the other end thereof can be driven by the flange **244** the rotatable device **24** to move inward. The terminal **272** is disposed in the case body **21** at bottom side thereof. While the elastic member **271** is driven to move inward, it will touch the terminal **272** to start a counter circuit (not shown) once.

A first touch switch **281** is disposed on the switch seat **253** of the elevating device **25**. The first touch switch **281** will touch the top wall of the case body **21** to start it while the elevating device **25** moves upward.

A second touch switch **282** is disposed in the case body **21** at bottom wall thereof positioning below the arm **254** of the elevating device **25**. The second touch switch **282** is started when the elevating device **25** moves downward.

The motor **22**, the counter **27** and the first and the second touch switches **281** and **282** of the elevating assembly **20** conducts to a circuit (not shown), and the circuit conducts to the electric socket **212** on the lateral side of the case body **21**.

The movable surface **30** is a rectangular board in this prefer embodiment, which has a ball aperture **31** on topside thereof and three recesses **32** on bottom side thereof corresponding to the elevating assemblies **20** respectively. Each recess **32** secures a seat **33** therein. Each seat **33** has a ball slot **331**, which has a bigger opening on the topside thereof corresponding to the opening end of the recess **32**. The ball heads **26** of the elevating devices **25** of the elevating assemblies **20** joint the ball slots **331** of the movable surface **30** respective to make the movable surface **30** can free incline relative to the elevating devices **25** in a predetermined angle range. In other words, the movable surface **30** is covered on the topsides of the elevating assemblies **30** with the left end thereof beside the sidewall **11** of the base **10**, the back end and the right end beside the back tunnel **14**, the return tunnel **15** and the front end thereof over the front end of the base **10**. The ball aperture **31** of the movable surface **30** corresponds to the ball hole **16** of the base **10**. The rigid movable surface **30** fastens a soft slope surface **34** at front side thereof to touch the ground as shown in FIG. **3**.

The optical sensor **40** has an infrared ray emitter **41** and an infrared ray receiver **42** secured at lateral sides of the movable surface **30** respectively closing to the front end thereof. The emitter **41** can emit infrared ray to the receiver **42**. If the infrared ray is cut by an object, such as a golf ball, the optical sensor **40** will provide a signal representing a ball is running through the movable surface **30**. The optical sensor **40** can be replaced by the other types of the sensors having same function, such as provides the emitter and the receiver at the same side and provides a reflect wall at the opposite side to reflect the infrared ray.

The interface unit **50** is to display information, broadcast audio messages and manual setting. Please refer to FIGS. from FIG. **9** to FIG. **11**, the interface unit **50** comprises a case **51** inserted into the case slot **19** on the sidewall **13** at the back side of the base **10**. Each lateral end of the case **51** is disposed a first pin **511**, a second pin **512** and a slidable device **52** thereon respectively. Each slidable device **52** has a first guiding slot **521** and a second guiding slot **522** at interior side thereof. The second guiding slot **522** further has a lock recess **523** therein. The first and the second pins **511** and **512** of the case **51** engage to the first and the second guiding slots **521** and **522** of the slidable devices **52** respectively with lock pins **524** disposed on the second pins **523** to be inserted into the lock recesses **523** in the second guiding slots **522** respectively for securing the slidable devices **52** on the case **51**. The case **51** disposes a speaker (not shown) therein for broadcasting music and voice messages. The case **51** further has a display portion **53** and a setting portion **54** on the front side thereof. The display portion **53** is twenty light-emitting diodes (LEDs) arranged as two rows on the case **10**. The setting portion **54** has three sets of elevating setting buttons **541**, each set of which has an up button and a down button, a mode setting button **542** and a mute button **543**. Three sets of the elevating setting buttons **541** are for controlling the three elevating assemblies **20** to move respectively.

The control unit **60** is disposed at the back side of the base **10**, which is constructed from microprocessors and a circuit. The control unit **60** conducts to the interface unit **50**, the elevating assemblies **20** (at the socket **212**), the optical sensor **40** and the detect device **18** in the ball hole **16** of the base **10** to integrate the actions of the elements of the putting train apparatus of the present invention. Give an example, user operates the setting unit **50** to control the elevating assemblies **20** to move upwards or to move downwards respectively, actually he/she operates the control unit **60** to drive the motors **22** of each elevating assembly **20** respectively to turn to a predetermined direction and a predetermined angle. The signals provided from the optical sensor **40** and the detect device **18** are processed in the control unit **60** for showing the corresponding information on the display portion **53** of the interface unit **50**.

Hereunder I will take one elevating assembly **20** to describe how it works.

When the control unit **60** commands the motor **22** of the elevating assembly **20** to turn, the rotatable device **24** will be driven to rotate first via the transmit device **23**. The rotatable device **24** will drive the elevating device **25** to move upwards or to move downwards as shown in FIG. **5** and FIG. **6** respectively. The ball head **26** at the top end of the elevating device **25** joints the seat **33** at the bottom side of the movable surface **30**, which works like an universal joint, to make movable surface **30** being bent to change the slope of the movable surface **30** when the elevating devices **25** of the elevating assemblies **20** are driven to move upwards or to move downwards. Thus, even there is only one elevating device **25** of the elevating assembly **20** is driven to move upwards or to move downwards but the other two elevating assemblies **20** don't, the movable surface **30** will change the slope without any interference. The front end of the soft slope surface **34** extends to the ground, no matter how is the slope of the movable surface **30** changed.

Please refer to FIG. **8**, while the elevating device **25** of the elevating assembly **25** is driven to move upwards and make the first touch switch **281** being against the top wall of the case **21**, which means the elevating device **25** moves to the top dead point. Or the elevating device **25** of the elevating assembly **25** is driven to move downwards and make the second touch switch **282** being against the bottom wall of the case **21** as shown in FIG. **9**, which means the elevating device **25** moves to the bottom dead point. The flange **244** of the rotatable device **24** will drive the elastic member **271** of the counter **27** touching the terminal **272**, while the rotatable device **24** is driven to rotate a circle. That will make the counter **27** counting once. The actions of the touch switches **281** and **282** and the counter **27** can provide signals to the control unit **60** to precisely control the motor **22** to start and to stop. Of course, a stepper motor can be produced

to the present invention to provide a precisely controlling of the elevating assembly.

I have to mention here, the present invention provides three elevating assemblies **20** to support the movable surface **30** at three points to make the movable surface **30** having an inclined flat portion within the three elevating assemblies **20**. The movable surface **30** also can be made from flexible board, such as rubber board or thin metal board. The amounts of the elevating assemblies **20** also can be provided as four or more to make the movable surface **30** having a variety of slopes.

If there is a ball running through the slope surface **34** and arriving the movable surface **30** on the base **10**, the optical sensor **40** will detect the ball, which means user putting once, and transmit a signal to the control unit **60**. The control unit **60** now will command the display portion **53** of the interface unit **50** showing the corresponding message, such as light a LED of the first row.

If a ball runs to the movable surface **30** but did not run into the ball hole **16** and did not run into the back tunnel **14** or the return tunnel **15**, the ball will run back to make the optical sensor **40** detecting the ball again. This will make a false detecting of the optical sensor **40**. To prevent this situation, the optical sensor **40** can be set to a delay detecting mode, which means the optical sensor **40** will detect nothing within a predetermined period after first time detecting. It also can be done by providing a second optical sensor (not shown in FIG.) to identify whether the ball is running from the ground to the movable surface **30** or is running back to the ground.

If a ball runs to the movable surface **30** and runs into the ball hole **16**, the ball will run back to the ground via the connect tunnel **17** and the return tunnel **15** to run back to the user. The detect device **19** will detect the ball at this time to give the control unit **60** a signal and show the corresponding information on the display portion **53** of the interface unit **50** showing the corresponding message, such as light a LED of the second row.

If a ball runs to the movable surface **30** but missing the ball hole **16** and runs into the back tunnel **14**, the ball will runs back to the ground via the return tunnel **15**. The ball also may run into the return tunnel **15** directly, it will run back to the ground too.

Please refer to FIG. **9**, the case **51** of the interface unit **50** can be totally received in the case slot **17**. At this time, the slidable devices **52** of the case **51** will be totally received in the case slot **19** too with the first and the second pins **511** and **512** on the lateral sides of the case **51** being against the bottom ends of the first and the second guiding slots **521** and **522** of the slidable devices **52** respectively and the lock pins **524** of the slidable devices **52** being locked at the bottom end of the lock slots **191** in the case slots **19** respectively. When pull the case **51** out from the case slot **19**, the slidable devices **52** will keep still first and the first and the second pins **511** and **512** will slide upwards and be against the top ends of the first and the second guiding slots **521** and **522** respectively to make the case **51** only can be pulled out half as shown in FIG. **10**. After that, the slidable devices **52** are driven to move with the case **51** to the top dead point thereof as shown in FIG. **11**. At this time, the total case **51** is exposed from the sidewall **13** at the back side of the base **10** and half of the slidable devices **52** will be exposed too. The lock pins **524** now are stopped at the top end of the lock slots **191** respectively. After the case **51** is pulled out totally, user can push the case **51** to lie back to make the second pins **512** thereof running into the lock recesses **523** on the topside of the second guiding slots **522** respectively to keep the case **51** in this angle as shown in FIG. **12**. That will make user can read the messages on the display portion **53** of the case **51** easily.

The circuit conduction and the circuit control of the prefer embodiment described above are not the main characters of the present invention, so I will not describe the detail here.

The operating modes and the characters of the golf putting training apparatus of the present invention are described hereunder:

1. User can change the slopes of the movable surface **30** as he/she wants via operating the elevating setting buttons **541** on the interface unit **50** for user can train the putting skill at a variety of slopes.

2. User also can operate the mode setting button **542** on the interface unit **50** to make the movable surface **30** to change the slope after a predetermined times of putting, such as user can set the movable surface **30** to change the slope automatically after ten times of putting or ten time of putting to the ball hole **16**.

3. The display portion **53** of the interface unit **50** will show the information of training, such as times of putting and times of putting into the ball hole **16**.

4. The training apparatus of the present invention can be set to an operation mode, which means user has to complete one operation, such as putting ten balls into the ball hole **16** in a predetermined slope of the movable surface **30**, then he/she can go to the next operation (with different slope). The degrees of difficulties of the operations are difficult more and more.

5. The speaker (not shown) in the case **51** can broadcast music or voice messages to encourage user or to speak out the messages corresponding to the present operating mode. The mute button **543** is to close the broadcast function.

In conclusion, the golf putting training apparatus of the present invention provides a simpler and a faster way to adjust the slope of the movable surface for user can change the slope by himself/herself. It further provides a variety of setting and selecting by programming to change the slope automatically. Thus, the golf putting training apparatus of the present invention can improve user's putting skill greatly after several times of training.

What is claimed is:

1. A golf putting training apparatus, comprising:

a base;

at least three elevating assemblies disposed at said base, each of said elevating assemblies having an elevating device respectively to be driven to move upwards and move downwards, said elevating assemblies not arranged in a line such that the top ends of said elevating devices construct a face;

a movable surface having a ball aperture thereon, the top ends of said elevating devices of said elevating assemblies connecting said movable surface to drive said movable surface to change the slope thereof,

a control unit for controlling said elevating devices of said elevating assemblies to move; and

wherein each of said elavating assemblies has a first touch switch and a second touch switch, each of which conducting to said control unit; said first touch switch will be started while said elavating device moves to top dead point and said second touch switch will be started while said elevating device moves to bottom dead point.

2. The golf putting training apparatus as defined in claim **1**, wherein said control unit controls said elevating assemblies by programming.

3. The golf putting training apparatus as defined in claim 1, wherein further comprises an interface unit, which has a display portion for displaying message and a setting portion for manual operating.

4. The golf putting training apparatus as defined in claim 3, wherein said base has a case slot at back side thereof, which has two lock slots respectively at lateral sidewalls therein; said interface unit having a case, each lateral side of which having a first pin and a second pin thereon respectively, two slidable devices, each of which having a first guiding slot and a second guiding slot at each lateral side thereof respectively; each second guiding slot having a lock recess therein; said slidable devices provided at the lateral sides of said case respectively with said first pins engaging said first guiding slots and said second pins engaging said second guiding slots respectively; each slidable device having a lock pin inserted into said lock slots of said case slot respectively; said display portion and said setting portion being disposed on the front side of said case.

5. The golf putting training apparatus as defined in claim 3, wherein said setting portion of said interface unit has elevating setting buttons for controlling said elevating devices of said elevating assemblies to move respectively.

6. The golf putting training apparatus as defined in claim 3, wherein said display portion of said interface unit has light-emitting diodes (LEDs) arranged as two rows; the first row of said light-emitting diodes showing the times of putting and the second row of light-emitting diodes showing the times of putting into ball hole.

7. The golf putting training apparatus as defined in claim 3, wherein interface unit disposes a speaker therein for broadcasting audio message.

8. The golf putting training apparatus as defined in claim 1, wherein further comprises an optical sensor disposed at the front side of said movable surface for detecting whether a ball runs to said movable surface; said optical sensor conducting to said control unit.

9. The golf putting training apparatus as defined in claim 1, wherein further comprises two optical sensors disposed at the front side of said movable surface for detecting whether a ball runs to said movable surface and the running direction of the ball, said optical sensors conducting to said control unit.

10. The golf putting training apparatus as defined in claim 1, wherein each elevating assembly further has a motor and a rotatable device respectively, wherein said motor conducts to said control unit, and rotatable device can be driven to rotate by said motor; said rotatable device having a screw portion at topside thereof; said elevating device having a screw tube to mesh with said screw portion of said rotatable device; said elevating device being disposed at the bottom side of said movable surface but can not be turned.

11. The golf putting training apparatus as defined in claim 10, wherein said rotatable device has a flange on the out surface thereof, an elastic member being disposed beside said rotatable having an end thereof fixed and the other end thereof movable, a terminal being disposed beside the movable end of said elastic member; said flange of said rotatable device pushing the movable end of said elastic member in rotating to drive said elastic member touching said terminal; said elastic member and said terminal conducting to a counter circuit; said counter circuit counting once while said elastic member touches said terminal.

12. The golf putting training apparatus as defined in claim 1, wherein said movable surface disposes at least three seats at bottom side thereof, each of which having a ball recess; each of said elevating device of said elevating assembly having a ball head jointing said ball recess of said seat respectively.

13. The golf putting training apparatus as defined in claim 1, wherein said base has a back tunnel at back side thereof, a return tunnel at a lateral side thereof communicating said back tunnel; said back tunnel being inclined downwards to the end communicating with said return tunnel; said return tunnel being inclined downwards from the end communicating with said back tunnel to the opposite end thereof; said return tunnel extending to the front end of said base; said base further having a ball hole corresponding to said ball aperture of said movable surface and a connect tunnel having an end communicating with said ball hole and the other end communicating with said return tunnel; said connect tunnel being inclined downwards from the end thereof communicating with said ball hole to the end thereof communicating with said return tunnel.

14. The golf putting training apparatus as defined in claim 1, wherein said base disposes a detect device in said ball hole for detecting whether a ball runs into said ball hole; said detect device conducting to said control unit.

15. The golf putting training apparatus as defined in claim 1, wherein said movable surface has a soft slope surface at front side thereof; the front end of side soft slope surface touching the ground.

16. The golf putting training apparatus as defined in claim 1, wherein said moveable surface is made from a flexible board.

17. A golf putting training apparatus, comprising:

a base;

at least three elevating assemblies disposed at said base, each of said elevating assemblies having an elevating device respectively to be driven to move upwards and move downwards, said elevating assemblies not arranged in a line such that the top ends of said elevating assemblies construct a face;

a movable surface having a hall aperture thereon, the top ends of said elevating devices of said elevating assemblies connecting said movable surface to drive said movable surface to change the slope thereof,

a control unit for controlling said elevating devices of said elevating assemblies to move;

wherein said base has a case slot at back side thereof, which has two lock slots respectively at lateral sidewalls therein; said interface unit having a case, each lateral side of which having a first pin and a second pin thereon respectively, two slidable devices, each of which having a first guiding slot and a second guiding slot at each lateral side thereof respectively; each second guiding slot having a lock recess therein; said slidable devices provided at the lateral sides of said case respectively with said first pins engaging said first guiding slots and said second pins engaging said second guiding slots respectively; each slidable device having a lock pin inserted into said lock slots of said case slot respectively; said display portion and said setting portion being disposed on the front side of said case.

18. A golf putting training apparatus, comprising:

a base;

at least three elevating assemblies disposed at said base, each of said elevating assemblies having an elevating device respectively to be driven to move upwards and move downwards, said elevating assemblies not arranged in a line such that the top ends of said elevating assemblies construct a face;

a movable surface having a ball aperture thereon, the top ends of said elevating devices of said elevating assem-

blies connecting said movable surface to drive said movable surface to change the slope thereof,

a control unit for controlling said elevating devices off said elevating assemblies to move;

wherein further comprises an interface unit, which has a display portion for displaying message and a setting portion for manual operating; and

wherein said display portion of said interface unit has light-emitting diodes (LEDs) arranged as two rows) the first row of said light-emitting diodes showing the times of putting and the second row of light-emitting diodes showing the times of putting into ball hole.

19. A golf putting training apparatus, comprising:

a base;

at least three elevating assemblies disposed at said base, each of said elevating assemblies having an elevating device respectively to be driven to move upwards and move downwards, said elevating assemblies not arranged in a line such that the top ends of said elevating assemblies construct a face;

a movable surface having a ball aperture thereon, the top ends of said elevating devices of said elevating assemblies connecting said movable surface to drive said movable surface to change the slope thereof, and

a control unit for controlling said elevating devices of said elevating assemblies to move;

wherein each elevating assembly further has a motor and a rotatable device respectively, wherein said motor conducts to said control unit, and rotatable device can be driven to rotate by said motor; said rotatable device having a screw portion at topside thereof; said elevating device having a screw tube to mesh with said screw portion of said rotatable device; said elevating device being disposed at the bottom side of said movable surface but can not be turned; and

wherein said rotatable device has a flange on the out surface thereof, an elastic member being disposed beside said rotatable having an end thereof fixed and the other end thereof movable, a terminal being disposed beside the movable end of said elastic member; said flange of said rotatable device pushing the movable end of said elastic member in rotating to drive said elastic member touching said terminal; said elastic member and said terminal conducting to a counter circuit; said counter circuit counting once while said elastic member touches said terminal.

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